

4. TROUBLESHOOTING

4-1. ERROR MODES

► This is a washer integrated error mode. For detailed information, refer to the general repair scripts.

Error Type	Drum			Fully automatic	Causes	Remarks
	Error mode	Old error mode	For USA			
Water Level Sensor	1E	1E E7	LE	1E	<ul style="list-style-type: none">- The part of the hose where the water level sensor is located is damaged (punctured).- The hose is clogged with foreign material.- The hose is folded.- Too much lubricant has been applied to the insertion part of the air hose.- Hose engagement error (disengaged)- Part fault (Faulty internal soldering)- The water level sensor terminal is disengaged.- Main PBA fault.	
Motor Driving Error and Hall Sensor Error	3E	3E EA EB 8E	3E	3E	<ul style="list-style-type: none">- The PBA connector terminal is not connected.- The motor spin net is not engaged.- The motor's internal coil is damaged (short-circuited or cut)- The hall sensor terminal is not connected.- Foreign material (a screw) has entered the motor.	For USA products, this error occurs because of restrained revolutions
	3E1	3E1	E3		<ul style="list-style-type: none">- Motor overloaded due to too much laundry (Non-sensing)- The motor hall sensor terminal is not connected.- PBA fault	For USA products, this error occurs when an interference is generated due to too much laundry, etc.
	3E2	3E2			<ul style="list-style-type: none">- The motor driving error from the PBA is weak. : Unstable relay operation, etc.	
	3E3	3E3	bE		<ul style="list-style-type: none">- This occurs due to erroneous operating signals for the motor hall sensor.- The IPM terminal of the main PBA is not connected.- The DD motor cover is out of place.	
	3E4	3E4			<ul style="list-style-type: none">- The PCB housing terminal is not connected.- PBA fault- DD motor fault	
Water Supply Error	4E	4E E1	nF	4E	<ul style="list-style-type: none">- Foreign material is entering the water supply valve.- The water supply valve terminal is not connected. (Wire disconnected)- The warm water and rinse connectors are wrongly connected to each other.- This occurs if the PCB terminal from the drain hose to the detergent drawer is not connected. Check whether the transparent hose is folded or torn.	If this error occurs in the Wool course
	4E1	4Ed	-		<ul style="list-style-type: none">- The cold and warm water supply hoses are wrongly engaged into each other.- The temperature of the water supplied through the dry valve during a dry cycle is sensed as higher than 70 °C.	The water supplied for 1 minute drying the drying cycle is 0.3 ~ 0.4 L.
	4E2	E8	-		<ul style="list-style-type: none">- The water temperature is sensed as higher than 50 °C in the Wool or Lingerie courses.	

Error Type	Drum			Fully automatic	Causes	Remarks
	Error mode	Old error mode	For USA			
Drain Error	5E	5E E5	nd	5E	<ul style="list-style-type: none"> - The pump motor impeller is damaged internally. - The wrong voltage (220 V → 110 V) is supplied to the parts. - Part fault - This occurs due to freezing in the winter season - The drain hose is clogged. (Injection error, foreign material) - Clogged with foreign material - The water pump terminal is not connected: rubber band, bills, cotton, hair pins, coins 	
Motor Error	8E		-	3E	<ul style="list-style-type: none"> - This occurs when motor driving is unstable because the motor hall sensor does not work. - This occurs when the PBA IPM operation is unstable or the control circuit has an error. - Check whether the wire connector is connected correctly or whether there is a contact error. 	
Power Error	9E1	PH1	2E	-	<ul style="list-style-type: none"> - Check the consumer's power conditions. <ul style="list-style-type: none"> : Make sure to check the operating voltage. Connect a tester to the internal power terminals during the Boil or Dry operations and observe the washing machine's operation carefully. : Check the voltages. (An error occurs when under or over voltage is supplied.) : Check whether a plug receptacle is used. When the connecting wire is 1m, a momentary low voltage may drop up to 10 V - Main PBA fault (sometimes) 	For Full Automated products, no error code is displayed for a power error.
	9E2	Plo				
			PF		<ul style="list-style-type: none"> - This error is not a fault but occurs during a momentary power failure <ul style="list-style-type: none"> : If started again when this error code is displayed, the operation restarts from the cycle that was stopped due to the power failure. : If the washing machine is not operating and this error code is displayed, it is displayed to notify that a power failure has occurred. 	
Communication Error	AE	13E	-	-	<ul style="list-style-type: none"> - The signals between the sub and main PBAs are not sensed because of a communications error. - Check the connector connections between the sub and main PBAs carefully. → Check for incorrect or loose connections, etc. - Remove the sub PBA C/Panel and check for any faulty soldering. 	
Switch Error (Main Relay Error)	bE1	12E	E2	-	<ul style="list-style-type: none"> - The Power button is pressed continually (for more than 12 seconds). - The switch is pressed unevenly because of a deformation of the control panel. - This error may occur when the screws that hold the sub PBA in place are tightened too much. 	
	bE2	14E			<ul style="list-style-type: none"> - A button other than the Power button is continually pressed (for more than 30 seconds). - Deformation of an internal plastic injection part - A screw for assembling the sub PBA is tightened too much. 	
	bE3	18E	Sr	-	<ul style="list-style-type: none"> - The main relay of the PBA is short-circuited. - The main relay terminal is connected incorrectly. (The terminal is bent and contact cannot be made.) 	When the PBA motor relay does not operate


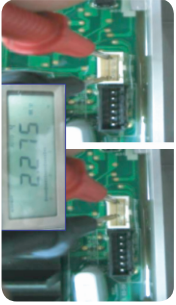


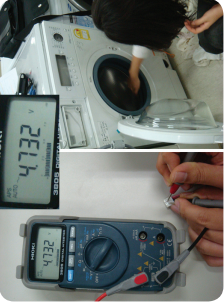
Error Type	Drum			Fully automatic	Causes	Remarks
	Error mode	Old error mode	For USA			
Cooling Error	CE	CE cE	-	-	<ul style="list-style-type: none"> - This occurs when the temperature of the washing machine is more than 55 °C and no draining is performed. (Reason: If hot water comes into contact with skin, it may cause burns.) - This occurs when the water temperature, for a specific course, exceeds 55 °C. In that case, the water will be drained to the Reset level. - This represents a thermal sensor error or any misuse of the unit. 	If this error occurs for another reason, it is due to a washing heater sensor fault. Replace it.
Door Error	dE door	dE Ed door	dS (Before operation)	dE	<ul style="list-style-type: none"> - A switch contact error because of a deformation of the door hook - When the door is pulled by force 	When the door is not opened after the door open operation
			dL (During operation)		<ul style="list-style-type: none"> - This occurs in the Boil wash because the door is pushed due to a pressure difference from internal temperature changes 	When the door is not locked after the door close operation
	dE1	dE1	LO (Unlock Fail)	-	<ul style="list-style-type: none"> - The door lock switch terminal is connected incorrectly. - The door lock switch terminal is broken. - This occurs intermittently because of an electric wire leakage - Main PCB fault 	
			FL (Lock Fail)			
	dE2	dE2	-	-	<ul style="list-style-type: none"> - This occurs if the Power switch is turned on/off continually and too much heat is generated (This error is difficult to be reproduced.) 	
Fan Error	FE	F FE	-	-	<ul style="list-style-type: none"> - The start condenser terminal comes out of place when inserting the top cover. - The fan motor has a wire disconnected or the belt is out of place. Therefore, the fan does not start. - The cooling wings are restrained or stains have developed on the bearings. Therefore, the fan does not start. - Start condenser fault → In this case, you cannot detect it with a tester. Always replace the start condenser 	

Error Type	Drum			Fully automatic	Causes	Remarks
	Error mode	Old error mode	For USA			
Heater Error	HE	HE E5	Hr (Heater Relay)	-	<ul style="list-style-type: none"> - The washing heater is short-circuited or has a wire disconnected. - The washing heater in the tub has an error. (Contact error, temperature sensor fault) - If the water level sensor operates without water because water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 °C, the washing machine turns the input power off. 	For USA products, if the heater has no error, this occurs because of a PBA relay malfunction.
	HE1	HE1 E1 Ec				
	HE2	HE2			<ul style="list-style-type: none"> - This error occurs when the red temperature sensor at the center of the dry heater operates (at a temperature higher than 125 °C) <p>: Corrective action – Press the button at the center lightly. The washing machine will operate normally.</p> <p>Alternatively, replace the temperature sensor if the temperature sensing is unstable because of functional degradation.</p>	
	HE3	-			<ul style="list-style-type: none"> - This occurs when the steam function does not operate normally. - This error does not occur in existing drum products. Check whether the product is a steam model 	
Water Leakage Error	LE LE1	11E E9	LE	LE	<ul style="list-style-type: none"> - Heater engagement fault (out of place) - The air hose is out of place and water leakage occurs during the spin cycle. - The tub back at the safety bolts fixing part is broken. - Water leakage occurs at the front with foaming because of too much detergent - Water leakage occurs because the connecting hose to the detergent drawer is connected incorrectly. - The drain pump filter cover is engaged incorrectly. - Water leakage occurs at the drain hose. - The duct condensing holding screws are worn. - The nozzle-diaphragm is engaged in the opposite direction or the rubber packaging is omitted. - Water leakage occurs because the screws that hold the tub back and front in place are fastened incorrectly. - The leakage sensor is faulty. 	
Overflow Error	OE OF	OE OF E3	OE	-	<ul style="list-style-type: none"> - Water is supplied continually because the water level detection does not work. - Because the drain hose is clogged and there is an injection error (at a narrow section), the water level detection does not work and water is supplied continually. - Water is supplied continually because of freezing or because there is foreign material in the water supply valve. - This error may occur when the water level sensor is degraded. 	For USA products, this error occurs because the water level sensor terminal is out of place.

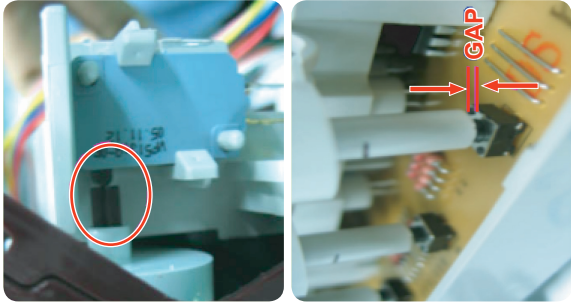
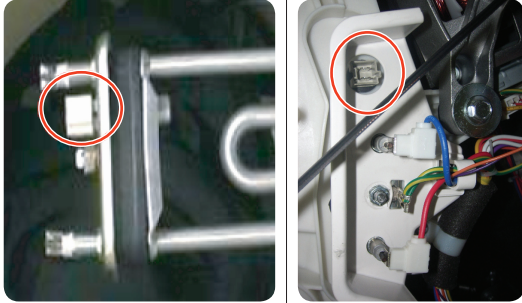
Error Type	Drum			Fully automatic	Causes	Remarks
	Error mode	Old error mode	For USA			
Temperature Sensor Error	tE1	tE1 6E	tE	-	<ul style="list-style-type: none"> - The washing heater in the tub has an error. (Contact error, temperature sensor fault) - The connector is connected incorrectly or is disconnected. - If the water level sensor operates without water because the water is frozen or for any other reason and the temperature sensor engaged at the bottom to prevent overheating for the washing heater detects a temperature of 100 to 150 °C, the washing machine turns the input power off. 	Heater sensor fault : When the connector is connected incorrectly or has a wire disconnected or contact error
	tE2	tE2	-	-	<ul style="list-style-type: none"> - The temperature sensor for the duct assy fan housing is faulty. (A sensor fault such as an internal short-circuit or wire disconnection) - The connector is out of place or has a contact error. 	Duct condensing temperature sensor fault (for models before the silver nano function was applied)
	tE3	tE3	-	-	<ul style="list-style-type: none"> - This occurs when the duct condensing temperature sensor is open. - This occurs when the duct condensing temperature sensor has a wire disconnected or is short-circuited. - The connector is out of place or has a contact error. 	Dry heater temperature sensor fault (for models before the silver nano function was applied)
Unbalance Error	UE	UE E4	dc	UE	<ul style="list-style-type: none"> - As laundry causes this error, check the laundry. - Find the reason for the unbalance and solve it as directed in the user manual. 	
Foaming Detected	Sud	-	SUdS	-	<ul style="list-style-type: none"> - This occurs when too much foaming is detected. It is also displayed while foaming is removed. When the removal is finished, the normal cycle proceeds. "Sud" or "SUdS" is displayed when too much foaming is detected and "End" is displayed when the removal of the foaming is finished. (This is one of the normal operations. It is an error for preventing non-sensing faults.) 	
Mems PBA Error Detected	-	-	E8	-	<ul style="list-style-type: none"> - Error detected in the Mems PBA or data error detected. Check the wire connections. Replace if necessary. <ol style="list-style-type: none"> 1. Check the wire connections. 2. Replace the Mems PBA. 3. Main PBA wire connection error or PBA's silver nano part malfunction. Replace if necessary. 	

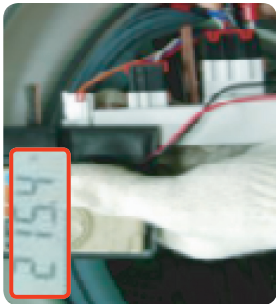

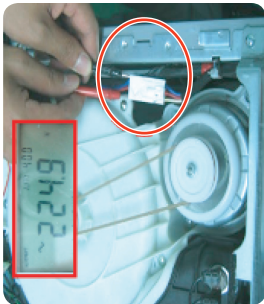

4-2. CORRECTIVE ACTIONS FOR EACH ERROR CODE

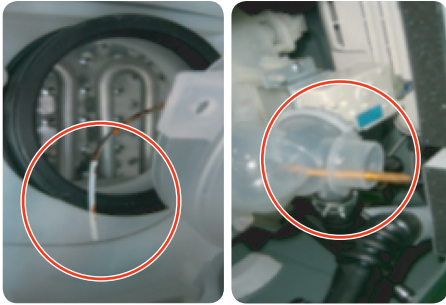

► These are common troubleshooting procedures for each drum-type washer error mode. For detailed information, refer to the general repair scripts.

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Water Level Sensor	1E	<ul style="list-style-type: none"> Water level sensor fault Incorrect connections of the water level sensor terminal The hose part for the water level sensor is folded. Main PCB fault 	<ul style="list-style-type: none"> Check the water level sensor terminal connections and contacts. An error occurs if an incorrect water level sensor is used. Make sure to check the material code. (Abnormal operation) If the water level sensor is faulty, replace it. If the error persists despite taking the action above, replace the PBA. 	 <p>Check the water level sensor frequency.</p> <ul style="list-style-type: none"> Check it after the water level sensor and the connector are connected. Frequency: Approx. 26.4 KHz with no load
Washing Motor Error and Hall Sensor Error	3E 3E1 3E2 3E3 3E4	<ul style="list-style-type: none"> Washing motor fault Washing motor hall sensor fault Incorrect connections of the washing motor/hall sensor connector Washing motor rotor and stator fault Main PCB fault 	<ul style="list-style-type: none"> Check the motor connector terminal connections and contacts. 3E1 is displayed because overloading occurs due to too much laundry. If the hall sensor terminal is faulty, replace the hall sensor. Check whether the stator of the motor cover is damaged. Check for coil disconnections due to foreign material. If the PBA control circuit is faulty, replace the PBA. 	<p>► DD MOTOR</p> <p>Check the resistance on the main PCB motor. (Between pins 1 and 3, and 1 and 4 of the four (4) pins)</p> <ul style="list-style-type: none"> Resistance: Approx. 2 to 4 MΩ Check the voltage when the power is on.  <p>► UNIVERSAL MOTOR</p> <p>Check the Resistance of Nos.1 and 4 of the wire pin on the side of the TACHO SENSOR.</p> <ul style="list-style-type: none"> Resistance: Approximately 40 to 45 Ω (Normal)   <p>► THREE PHASE MOTOR</p> <p>Measure the Resistance of Nos. 2 and 3 of the wire pin on the side of the HALL SENSOR.</p> <ul style="list-style-type: none"> The revolution of the drum needs to be reproduced. (Turn the drum by hand.) Resistance: Approximately 3 to 12V (Voltages may differ depending on the speed of the revolutions.) 

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Water Supply Error	4E 4E1 4E2	<ul style="list-style-type: none"> Water supply valve fault Main PCB fault Freezing in the winter season 	<ul style="list-style-type: none"> If the water supply valve has a wire disconnected, replace it. Check whether the water supply valve is clogged with foreign material and whether water is supplied continually. Check whether no water is supplied because of freezing in the winter season. If the PBA relay operates abnormally, replace the PBA. 	  <ol style="list-style-type: none"> 1. Check the resistance for the water supply valve. Resistance: 4.0 to 5.0 Ω between the terminals of the water supply valve. 2. Check whether there is foreign material in the water supply valve diaphragm.
Drain Error	5E	<ul style="list-style-type: none"> Drain pump fault Freezing in the winter season Foreign materials in the drain pump Main PCB fault 	<ul style="list-style-type: none"> Check whether the revolutions of the drain pump motor are restrained by foreign material. Check the same thing for the natural drain process. Check whether the connections are correct and if there is any wires disconnected. If the drain pump operates abnormally intermittently when the temperature of the water in the tub is high. If the motor revolutions are restrained due to freezing in the winter season, check the method to remove the freezing and remove as directed. 	  <p>▲ DRAIN MOTOR Resistance: Approximately 6.3 Ω between the Terminals for the Water Supply Valve</p> <p>▲ DRAIN PUMP Resistance: Approximately 174 Ω between the Terminals for the Water Supply Valve</p>
Communication Error	AE	<ul style="list-style-type: none"> The signals between the sub and main PBAs are not sensed. Incorrect wire connections between the sub and main PBAs. 	<ul style="list-style-type: none"> Check the wire connections and terminal contacts between the sub and main PBAs. Check for disconnected wires. Check whether the sub PBA is short-circuited because of moisture. If the main PBA's communication circuit is faulty, replace it. 	

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Switch Error (Main Relay Error)	bE1 bE2 bE3	<ul style="list-style-type: none"> The Power button is continually pressed. A button other than the Power button is continually pressed. Main PCB relay fault 	<ul style="list-style-type: none"> Check whether either the Power switch or a tact switch is continually pressed. Check whether the service PBA holding screws are fastened too much. If they are fastened too much, loosen them a little. If the main PBA switching IC on/off error has occurred, replace the main PBA. The "bE3" error occurs if the main relay connections are incorrect. Check the connections. If there is no error in the connections, replace the main PBA. 	<p>Check the contact between the control panel buttons and their corresponding tact switch.</p> <ul style="list-style-type: none"> There must be a gap between a control panel button and its corresponding micro switch. Otherwise, an error occurs after approx. 30 seconds has passed. 
Cooling Error	CE	<ul style="list-style-type: none"> Washing temperature sensor fault Description of PL hazard prevention 	<ul style="list-style-type: none"> This error occurs if the water temperature is more than 50 °C in draining. Check the temperature. If the water temperature is normal, this error is due to a temperature sensor fault. Replace the washing heater. When replacing the washing heater, take care to prevent water leakage. 	<p>Check the resistance on the Heater. (For faulty features)</p> <p>Check the voltages on the red / blue terminals of the Heater while washing.</p> <p>Check 27±10% on both terminals and the voltage of the Heater.</p> 

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Door Error	dE dE1 dE2	<ul style="list-style-type: none"> Door switch fault Drain pump fault Dry duct fan motor fault. Main PCB fault 	<ul style="list-style-type: none"> If a dE error occurs, check whether it occurs during the Boil cycle. If it is detected that the door is open, close the door. The 220V is directly connected to the door. Check and repair the power wire connections and insulation state. Check the door switch. Replace if faulty. Check the main PBA door sensing circuit. Replace if faulty. 	<p>▲ TYPE 1</p> <p>Check the door switch voltage. Check the voltage after the power is on. (That is, check the door switch when the power button is turned on and no operating key is pressed.)</p>  <p>▲ TYPE 2</p> <p>The resistance of Nos. 3 and 5 of the DOOR LOCK SWITCH must be approximately 949 Ω.</p> 
Dry Duct Fan Error	FE	<ul style="list-style-type: none"> Dry duct fan motor fault Main PCB fault 	<ul style="list-style-type: none"> Check for disconnected wires and insulation defects for the dry motor. Check connector connections and contact faults. If the start condenser has a functional error, the motor rotates normally. However, because the start condenser operates unstably, replace it. 	<p>▲ TYPE 1</p> <p>Check the dry fan motor operation. Check the motor voltage during the dry cycle.</p>  <p>▲ TYPE 2</p> <p>The resistance of both terminals of the AIR WASH MOTOR must be approximately 298 Ω.</p> 

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Heater Error	HE HE1 HE2 HE3	<ul style="list-style-type: none"> • Heater fault • A fault of the red temperature sensor at the center of the dry heater • Steam function fault • Freezing in the winter season 	<ul style="list-style-type: none"> • Check for disconnected wires for the washing heater. Replace if faulty. <ul style="list-style-type: none"> - An HE or HE1 error occurs. • Because the dry heater or air refresh heater overheating sensor is faulty, replace it. <ul style="list-style-type: none"> - An HE2 error occurs. • Check the steam heater. Replace if faulty. <ul style="list-style-type: none"> - An HE3 error occurs. 	
Water Leakage Error	LE LE1	<ul style="list-style-type: none"> • Check for any leakage. • Foreign material in the DV case • Fault of a hose or incorrect part engagement in the product 	<ul style="list-style-type: none"> • Check for any leakage on the base, Hose, Valve and Tub connections and take any required action. • For natural draining, this error occurs because the drain bellows are clogged with foreign material. Remove the foreign material. • Check the drain motor operation. Replace if it does not operate normally. 	 <p>► DRAIN PUMP TYPE (Automatic Drainage) Check whether there is any foreign material in the bellows. <input checked="" type="checkbox"/> Check for any foreign material, such as underwear wires or coins.</p>
Overflow Error	OE OF	<ul style="list-style-type: none"> • Water level sensor fault • Freezing in the winter season 	<ul style="list-style-type: none"> • If the water level sensor has a functional error, replace it. • Check the hose. This error occurs if it is torn or has a hole. • This error occurs if water is frozen in the winter season. Check the method to remove freezing and follow as directed. 	 <p>► PUMP TYPE Check for any leakage on the base, Hose, Valve and Tub connections.</p> <p>Check the hose connected to the water level sensor. <input checked="" type="checkbox"/> Check whether the hose is folded, cut, or damaged.</p>

Error Type	Error Mode	Causes	Corrective Actions	Description of Photo
Temperature Sensor Error	tE1 tE2 tE3	<ul style="list-style-type: none"> • Washing temperature sensor fault • Dry temperature sensor fault • Faulty and incorrect connections of the dry condensing sensor • Main PCB fault • Freezing in the winter season 	<ul style="list-style-type: none"> • Check the connections for the washing heater temperature sensor connector. • If the washing heater temperature sensor has a functional error, replace it. <ul style="list-style-type: none"> - A tE1 error occurs. • Check the connections for the dry heater temperature sensor connector. • If the dry heater temperature sensor has a functional error, replace it. <ul style="list-style-type: none"> - A tE2 error occurs. • Check the connections for the duct condensing temperature sensor connector. • If the duct condensing temperature sensor has a functional error, replace it. <ul style="list-style-type: none"> - A tE3 error occurs. 	-
Unbalance Error	UE	<ul style="list-style-type: none"> • Motor hall sensor fault • Caused by the laundry 	<ul style="list-style-type: none"> • Check the type of laundry. Check whether they may cause an unbalanced situation. <ul style="list-style-type: none"> - If they are small but absorb a lot of water, make sure to check and follow the related directions in the user manual and follow the directions. 	-

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